VMware vCenter Configuration Manager Software Provisioning Components Installation and User Guide

Package Studio 1.1

Software Repository for Windows 1.1

Package Manager 3.0

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About This Book

This manual, *vCenter Configuration Manager Software Provisioning Components Installation and User's Guide*, describes how to install the components, use the components to create software packages, publish packages to repositories, and install software on target machines.

Intended Audience

To use this information effectively, you must have a basic understanding of how to configure network resources, install software, and administer operating systems. You also need to fully understand your network topology and resource naming conventions.

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1 Introduction to VCM Software Provisioning

Software provisioning is the process you use to create software packages, publish the packages to repositories, and then install packages on one or more target machines.

To support the provisioning process, the VCM Software Provisioning components consist of VMware vCenter Configuration Manager Package Studio, software package repositories, and Package Manager.

VMware vCenter Configuration Manager Package Studio

Package Studio is the application used to build software packages for installation on target Windows servers and workstations.

A software package provides the files and metadata necessary to install and remove programs. One of the most useful features of a package is the metadata regarding dependencies, conflicts, and other relationships that are not represented by software installation files. This metadata is used to determine if the necessary dependencies are in place so that an installation is successful, and if not, what is necessary to make the installation successful. This use of metadata is similar to rpm on Linux.

Packages support commercial and custom software that may be installed using any Windows installation technology, including .msi, .exe, or scripts (Python, VBScript, PowerShell, and others).

After you create a package and it is ready for distribution, it is published to a software repository. You then use Package Manager to download the package from the repository to the local machine and install it on your Windows systems.

Software Repository for Windows

Software Repository for Windows is the shared location to which packages are published by Package Studio and the location from which Package Manager downloads packages for installation.

Package Manager for Windows

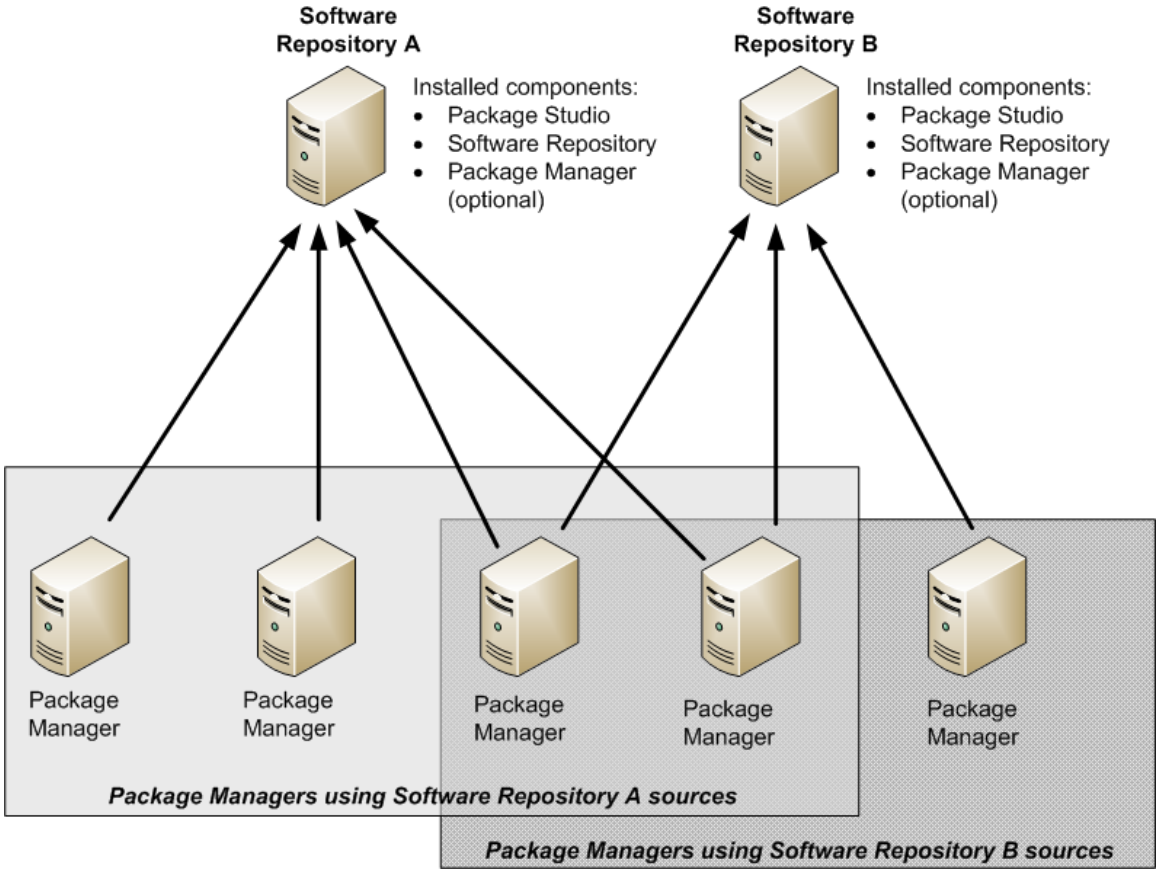
Package Manager is the application installed on each machine to manage the installation and removal of the software contained in packages. Package Manager is configured to use one or more repositories as sources for packages.

If you are using the software provisioning components in conjunction with VMware vCenter Configuration Manager (VCM), you can use VCM to add and remove sources, and to install and remove packages.

Software Provisioning Component Relationships

The following diagram displays the general relationship between Package Studio, repositories, and Package Manager in a working environment.

Figure 1–1. Software Provisioning Diagram



Installing the Software Provisioning Components

2

The software provisioning components should be installed on machines with these relationships:

- **Software Repository for Windows:** Installed on at least one Windows machine in your environment, and installed on the same machine with Package Studio. Install the repository before installing Package Studio.
- **VMware vCenter Configuration Manager Package Studio:** Installed on the same machine as your software repository.
- **Package Manager:** Installed on all Windows machines on which you are managing software provisioning.

To uninstall the applications using a script at a later date, you should save a copy of each of the .msi files in an archive location. To uninstall using the .msi, you must have the same version used to install the application.

Software Provisioning Requirements

VCM Software Provisioning provides the components to create software provisioning packages, publish the packages to repositories, and install and remove software packages on target machines.

Table 2–1. Software Provisioning Operating System and Hardware Requirements

Supported Operating System	Supported Hardware Platform
Microsoft Windows 7	x86, x64
Microsoft Windows Server 2008 R2	x64
Microsoft Windows Server 2008 SP2	x86, x64
Windows Vista SP2	x86, x64
Microsoft Windows XP SP3	x86
Microsoft Windows XP SP2	x64
Microsoft Windows Server 2003 R2 SP2	x86, x64
Microsoft Windows Server 2003 SP2	x86, x64

Software Provisioning Component Software Requirements

The VCM Software Provisioning components and their software requirements are listed here.

Table 2–2. Software Provisioning Component Requirements

Software Provisioning Component	Description	Requirements
VMware vCenter Configuration Manager Package Studio	Application used to the create the software packages.	.NET 3.5.1 or higher
Software Repositories	File system used to store the shared software packages.	.NET 3.5.1 and IIS 6, 7, or 7.5
Package Manager	Application on each managed machine that downloads packages from repositories, and installs and removes the software contained in the packages.	.NET 3.5.1 or higher

You can use any virtual machine guest on VMware ESX and ESXi Servers that meets these requirements for any of the VCM Software Provisioning components.

Install Software Repository for Windows

The Software Repository for Windows and the VMware vCenter Configuration Manager Package Studio should be installed on the same machine. Installing the repository installs the Repository folders and subfolders, and configures the virtual directory. The virtual directory is used by Package Manager to access the repository.

Prerequisites

- Verify that the target machine meets the supported hardware, operating system, and software requirements. See *VCM Installation Guide* for currently supported platforms and requirements.
- Ensure that you have access to the `Repository.msi`, which is available on the VMware Web site or in the vCenter Configuration Manager application files.The default location in the VCM application files is `C:\Program Files (x86)\VMware\VCM\AgentFiles\Products`.

Procedure

1. Double-click `Repository.msi`.
2. On the Welcome page, click **Next**.
3. Review the license agreement, select the appropriate options to continue, and click **Next**.
4. On the Installation Folder page, use the default path or click **Change** to modify the path.

   When the path is correct, click **Next**.
5. On the Virtual Directory page, use the default name or type a new name in the text box, and click **Next.**.
6. On the Ready to Install page, click **Install**.
7. When the Setup Completes page appears, click **Finish**.

The repository and the virtual directory are added to the locations specified during installation. The default location for the repository is `C:\Program Files\VMware\VCM\Tools\Repository` (on 32-bit machines) or `C:\Program Files (x86)\VMware\VCM\Tools\Repository` (on 64-bit machines). The default virtual directory SoftwareRepository is added to **Internet Information Services (IIS) > Web Sites > Default Web Site**.

Install Software Repository for Windows Using Unattended .MSI

As an alternative to the standard installation process, you can run the repository installation .msi in an unattended installation.

Prerequisites

- Verify that the target machine meets the supported hardware, operating system, and software requirements. See *VCM Installation Guide* for currently supported platforms and requirements.
- Ensure that you have access to the `Repository.msi`, which is available on the VMware Web site or in the vCenter Configuration Manager application files.The default location in the VCM application files is `C:\Program Files (x86)\VMware\VCM\AgentFiles\Products`.

Procedure

1. On your Collector, navigate to `C:\Program Files (x86)\VMware\VCM\AgentFiles\Products`.
2. Locate the `Repository.msi` file, and then copy it to the target machine. You can also run it from a shared location.
3. On the target machine, run the .msi file using the following command:

   ```
   msiexec /i [path]\Repository.msi /qn /l*v %temp%\Repository.log
   ```

   You can add the following arguments if you want to specify locations other than the default directories:

   `REPOSITORY_ROOT="C:\Program Files (x86)\VMware\VCM\Tools\Repository\"` (defaults to this path)

   `VIRTUAL_DIR_NAME_REPOSITORY=SoftwareRepository` (defaults to this value)

Software Repository Structure

The files for a repository consist of the main folder (for example, SoftwareRepository). In this file are the following:

- .hive: Contains the repository management files, including such files as repository.index and repository.toc.
- crates: Contains alphabetical sub folders. It is to this location that the packages (.crate files) are published.
- dists: Contains crates.gz files. These files are metadata about the .crate files.

Manually Uninstall the Repository

Using the following command line syntax, you can run an unattended uninstall the software repository.

Prerequisites

- To uninstall the application, you must use the same version of the `Repository.msi` that was used to install the application.

Procedure

1. Copy the `Repository.msi` to the machine on which you are uninstalling the application or point to the file in a shared directory.
2. Run the .msi file using the following command line syntax:

   ```
   msiexec /x [path]\Repository.msi /l*v %temp%\Repository.log
   ```

Manually Configure Repositories

Although you can use the installation file to install a repository on a machine, it may be necessary to manually create one.

The repository and the VMware vCenter Configuration Manager Package Studio should be installed on the same machine.

The available procedures are for IIS 6 or IIS 7.

Manually Configure Repositories on IIS 7 and Later

You can manually create repositories on Vista, Windows 7, or Windows 2008 systems running IIS 7 and later if you do not want to use the standard installation package.

Prerequisites

- Verify that the target machine meets the supported hardware, operating system, and software requirements. See *VCM Installation Guide* for currently supported platforms and requirements.

Procedure

1. Create a repository directory on your desired drive.

   For example, `C:\WindowsRepository`.
2. Open Internet Information Services (IIS) Manager.
3. Expand **<machine name> > Sites**.
4. Right-click **Default Web Site** and select **Add Virtual Directory**.
5. In the Add Virtual Directory dialog box, type a name in the Alias text box.

   For example, SoftwareRepository.
6. Click the **Physical path** ellipsis button.
7. In the Browse for Folder dialog box, locate and select the repository directory you previously created.

   For example, `C:\WindowsRepository`.
8. Click **OK** to close the Browse for Folder dialog box.
9. Click **OK** to close the Add Virtual Directory dialog box.
10. Select the new virtual directory you just added, and then double-click **Directory Browsing** in <yourdirectoryname> Home pane.
11. In the Actions pane, click **Enable**.
12. Click **Back** until you are again on the <yourdirectoryname> Home pane, and then click on **MIME Types**.
13. In the Actions pane, click **Add**.
14. In the Add MIME Type dialog box, add the following MIME types with these names and settings:
    - **File name extension:** .crate and **MIME type:** application/octet-stream
    - **File name extension:** .index and**MIME type:** application/octet-stream
    - **File name extension:** .options and **MIME type:**application/octet-stream
    - **File name extension:** .info and **MIME type:**application/octet-stream
15. Close IIS.

16. Open a Command Prompt window and browse to the repository folder you previously created.
17. At the command prompt, type mkdir .hive and press **Enter**.
18. At the command prompt, type mkdir dists and press **Enter**.
19. Open a blank document in a text editing application, such as Notepad, add <RepositoryIndex></RepositoryIndex> to the contents, and click **File > Save As**.
20. In the Save As dialog box, change the file name to repository.index.
21. Change the Save as type to **All Files** and save the file in the previously created `.hive` folder.
22. Open a blank document in a text editing application, such as Notepad, and click **File > Save As**.

    Do not add any text.
23. In the Save As dialog box, change the file name to repository.info.
24. Change the Save as type to **All Files** and save the file in the previously created `.hive`folder.

Open an Internet Explorer window and browse to your virtual directory. For example, `http://<machinename>/SoftwareRepository`.

The web page displays the `.hive` and `dists` folders. After you publish packages using the VMware vCenter Configuration Manager Package Studio, a `crates` folder is added.

Manually Configure Repositories on IIS 6

You can manually create repositories on Windows 2003 systems running IIS 6 if you do not want to use the standard installation package.

Prerequisites

- Verify that the target machine meets the supported hardware, operating system, and software requirements. See *VCM Installation Guide* for currently supported platforms and requirements.

Procedure

1. Create a repository directory on your desired drive.

   For example, `C:\WindowsRepository`.
2. Open Internet Information Services (IIS) Manager.
3. Expand **<machine name> >Web Sites**.
4. Right-click **Default Web Site** and select **New > Virtual Directory**. The Welcome to the Virtual Directory Creation Wizard appears.
5. On the Welcome to the Virtual Directory Creation Wizard page, click **Next**.
6. On the Virtual Directory Alias page, type a name in the **Alias** text box, for example, `SoftwareRepository`, and click **Next**.
7. On the Web Site Content Directory page, click **Browse**, locate the repository directory you previously created, and click **Next**.

   For example, `C:\WindowsRepository`.
8. On the Virtual Directory Access Permissions page, select **Read**, **Run scripts**, **Browse**, and click **Next.** The You have successfully completed the Virtual Directory Creation Wizard page appears.
9. On the You have successfully completed the Virtual Directory Creation Wizard page, click **Finish**.

   The new repository virtual directory alias is added to the Default Web Sites list.

10. Right-click the new repository directory and select **Properties**.
11. In the <directory name> Properties dialog box, click the **Virtual Directory** tab, and then click **Remove**, located to the right of Application name text box.

    Application name and Application pool are disabled.
12. Click the **HTTP Headers** tab and click **MIME Types**.
13. In the MIME Types dialog box, add the following MIME types with these names and settings:
    - **Extension:** .crate and **MIME type:** application/octet-stream
    - **Extension:** .index and **MIME type:** application/octet-stream
    - **Extension:** .gz and **MIME type:** application/octet-stream
    - **Extension:** .options and **MIME type:**application/octet-stream
    - **Extension:** .info and **MIME type:**application/octet-stream
14. Click **OK** to save your settings and close the MIME Types dialog box.
15. On the Properties dialog box, click **OK** to close the dialog box.
16. Open a Command Prompt window and browse to the repository folder you previously created.
17. At the command prompt, type mkdir .hive and press **Enter**.
18. At the command prompt, type mkdir dists and press **Enter**.
19. Open a blank document in a text editing application, such as Notepad, and add <RepositoryIndex></RepositoryIndex> to the contents.
20. Click **File > Save As**.
21. In the Save As dialog box, change the file name to repository.index and save the file in the previously created .hive folder.
22. Open a blank document in a text editing application, such as Notepad, and click**File > Save As**.
23. In the Save As dialog box, change the file name to repository.info, and then save the empty file in the previously created `.hive` folder.

Open an Internet Explorer window, and then browse to your virtual directory. For example, `http://<machinename>/SoftwareRepository`.

The web page displays the `.hive` and `dists` folders. After you publish packages using the VMware vCenter Configuration Manager Package Studio, a `crates` folder is added.

Configuring Mirrored Repositories

Mirrored repositories are configured where one repository is mirrored from another.

The most common use of mirrored repositories is if you have a repository in your main office and one in your satellite office. You do not want to install packages to machines in the satellite office across your wide area network. Configuring a mirrored repository will reduce the strain on your WAN, allowing the satellite office machines to install packages from a local repository.

The available procedures are for IIS 6 or IIS 7.

Configure Mirrored Repositories for IIS 7 and Later

Mirrored repositories are configured where one repository is mirrored from another.

Prerequisites

- Verify that the target machine meets the supported hardware, operating system, and software requirements. See *VCM Installation Guide* for currently supported platforms and requirements.

Procedure

1. Create a repository directory on your desired drive.

   For example, `C:\WindowsRepository`.

2. Open Internet Information Services (IIS) Manager.
3. Expand **<machine name> > Sites**.
4. Right-click **Default Web Site** and select **Add Virtual Directory**.
5. In the Add Virtual Directory dialog box, type a name in the Alias text box.

   For example, SoftwareRepository.

6. Click the **Physical path** ellipsis button.
7. In the Browse for Folder dialog box, locate and select the repository directory you previously created.

   For example, `C:\WindowsRepository`.

8. Click **OK** to close the Browse for Folder dialog box.
9. Click **OK** to close the Add Virtual Directory dialog box.
10. Select the new virtual directory you just added, and then double-click **Directory Browsing** in <yourdirectoryname> Home pane.
11. In the Actions pane, click **Enable**.
12. Click **Back** until you are again on the <yourdirectoryname> Home pane, and then click on **MIME Types**.
13. In the Actions pane, click **Add**.
14. In the Add MIME Type dialog box, add the following MIME types with these names and settings:
    - **File name extension:** .crate and **MIME type:** application/octet-stream
    - **File name extension:** .index and**MIME type:** application/octet-stream
    - **File name extension:** .options and **MIME type:**application/octet-stream
    - **File name extension:** .info and **MIME type:**application/octet-stream
15. Close IIS.
16. Copy and paste the contents of the original Repository folder, the `.hive` folder, the `dist` folder, and the `crates` folder, to the new repository location.
17. Add the new repository entry to the machine registry.

    On a 64-bit machine, go to `HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\VMware, Inc.\LocalRepositories`.

    On a 32-bit machine, go to `HKEY_LOCAL_MACHINE\SOFTWARE\VMware, Inc.\LocalRepositories`.

18. Right-click **LocalRepositories** and select **New > String Value**.
19. Right-click the new value and select **Rename**.
20. Type the name of your new repository.

21. Right-click the new repository name and select **Modify**.
22. In the Data Value text box, type the fully qualified URI for the repository.

    For example, `http://<machinename>/NewRepository`.
23. Click **OK**.
24. Open an Internet Explorer window and browse to your new virtual directory.

    For example, `http://<machinename>/NewRepository`.

    The web page should display the .hive,dists, and crates folders. The crates folder contains any copied packages (*.crate files).

To keep the new repository synchronized with the original repository, you must continue to copy the files from the original repository to the new repository. You can use one of these methods:

- Manually copy the files from the original repository to the new repository.
- Use a commercial mirroring application.
- If you are using VCM, you configure the Remote Command Package Mirroring template to copy packages between repositories, or write you own VBScript to run as a remote command to copy the files specified in the configuration steps above from the old repository to the new repository.

Configure Mirrored Repositories for IIS 6

Mirrored repositories are configured where one repository is mirrored from another.

Prerequisites

- Verify that the target machine meets the supported hardware, operating system, and software requirements. See *VCM Installation Guide* for currently supported platforms and requirements.

Procedure

VCM Installation Guide

1. Create a repository directory on your desired drive.

   For example, `C:\WindowsRepository`.
2. Open Internet Information Services (IIS) Manager.
3. Expand **<machine name> >Web Sites**.
4. Right-click **Default Web Site** and select **New > Virtual Directory**. The Welcome to the Virtual Directory Creation Wizard appears.
5. On the Welcome to the Virtual Directory Creation Wizard page, click **Next**.
6. On the Virtual Directory Alias page, type a name in the **Alias** text box, for example, `SoftwareRepository`, and click **Next**.
7. On the Web Site Content Directory page, click **Browse**, locate the repository directory you previously created, and click **Next**.

   For example, `C:\WindowsRepository`.
8. On the Virtual Directory Access Permissions page, select **Read**, **Run scripts**, **Browse**, and click **Next.** The You have successfully completed the Virtual Directory Creation Wizard page appears.
9. On the You have successfully completed the Virtual Directory Creation Wizard page, click **Finish**.

   The new repository virtual directory alias is added to the Default Web Sites list.

10. Right-click the new repository directory and select **Properties**.
11. In the <directory name> Properties dialog box, click the **Virtual Directory** tab, and then click **Remove**, located to the right of Application name text box.

    Application name and Application pool are disabled.
12. Click the **HTTP Headers** tab and click **MIME Types**.
13. In the MIME Types dialog box, add the following MIME types with these names and settings:
    - **Extension:** .crate and **MIME type:** application/octet-stream
    - **Extension:** .index and **MIME type:** application/octet-stream
    - **Extension:** .gz and **MIME type:** application/octet-stream
    - **Extension:** .options and **MIME type:**application/octet-stream
    - **Extension:** .info and **MIME type:**application/octet-stream
14. Click **OK** to save your settings and close the MIME Types dialog box.
15. On the Properties dialog box, click **OK** to close the dialog box.
16. Copy and paste the contents of the original Repository folder, the `.hive` folder, the `dist` folder, and the `crates` folder, to the new repository location.
17. Add the new repository entry to the machine registry. On a 64-bit machine, go to `HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\VMware, Inc.\LocalRepositories`. On a 32-bit machine, go to `HKEY_LOCAL_MACHINE\SOFTWARE\VMware, Inc.\LocalRepositories`.
18. Right-click **LocalRepositories** and select **New > String Value**.
19. Right-click the new value and select **Rename**.
20. Type the name of your new repository.
21. Right-click the new repository name and select **Modify**.
22. In the Data Value text box, type the fully qualified URI for the repository. For example, `http://<machinename>/NewRepository`.
23. Click **OK**.
24. Open an Internet Explorer window, and then browse to your new virtual directory.

    For example, `http://<machinename>/NewRepository`.

    The web page should display the .hive,dists, and crates folders. The crates folder contains any copied packages (*.crate files).

To keep the new repository synchronized with the original repository, you must continue to copy the files from the original repository to the new repository. You can use one of the following methods:

- Manually copy the files from the original repository to the new repository.

- Create a VBScript to copy IIS metabase and schema from on machine to another. The following article assumes both machines are running Windows Server 2003: http://www.microsoft.com/technet/prodtechnol/WindowsServer2003/Library/IIS/81f04967-f02f-4845-9795-bad2fe1a1687.mspx?mfr=true.
- Use a commercial mirroring application.
- If you are using VCM, you configure the Remote Command Package Mirroring template to copy packages between repositories, or write you own VBScript to run as a remote command to copy the files specified in the configuration steps above from the old repository to the new repository.

Install Package Studio

The VMware vCenter Configuration Manager Package Studio and the repository must be installed on the same machine. The process installs the application files and specifies the repository to which Package Studio will publish packages.

Prerequisites

- Verify that the target machine meets the supported hardware, operating system, and software requirements. See *VCM Installation Guide* for currently supported platforms and requirements.
- Ensure you have access to the `PackageStudio.msi`, which is available on the VMware Web site or in the vCenter Configuration Manager application files. The default location in the VCM application files is `C:\Program Files (x86)\VMware\VCM\AgentFiles\Products`.
- (Recommended) Software Repository for Windows is installed. Installing the repository before installing Package Studio will reduce the manual configuration steps.

Procedure

1. Double-click `PackageStudio.msi`.
2. On the Welcome page, click **Next**.
3. Review the license agreement, select the appropriate options to continue, and click **Next**.
4. On the Installation Folder page, use the default path or click **Change** to modify the path, and click **Next**.
5. On the Repository Root Folder page, verify the path is to your installed repository files.

   If the path is not accurate, click **Change**. When the path is correct, click **Next**.
6. On the Ready to Install page, click **Install**.
7. On the Setup Complete page, click **Finish**.

The Package Studio is installed to the location specified during installation. The default location is `C:\Program Files\VMware\VCM\Tools\Package Studio` (on 32-bit machines) or `C:\Program Files (x86)\VMware\VCM\Tools\Package Studio` (on 64-bit machines).

To start Package Studio, click **Start** and select **All Programs > VMware vCenter Configuration Manager > Tools > Package Studio**, or open the Package Studio folder and double-click **PackageStudio.exe**.

Install Package Studio Using Unattended .MSI

The manual installation process installs the application files and specifies the repository to which Package Studio will publish packages.

Prerequisites

- Verify that the target machine meets the supported hardware, operating system, and software requirements. See *VCM Installation Guide* for currently supported platforms and requirements.
- Ensure you have access to the `PackageStudio.msi`, which is available on the VMware Web site or in the vCenter Configuration Manager application files. The default location in the VCM application files is `C:\Program Files (x86)\VMware\VCM\AgentFiles\Products`.
- (Recommended) Software Repository for Windows is installed. Installing the repository before installing Package Studio will reduce the manual configuration steps.

Procedure

1. On your Collector, go to `C:\Program Files (x86)\VMware\VCM\AgentFiles\Products`.
2. Locate the `PackageStudio.msi` file and copy it to the target machine.

   You can also run the .msi from a shared location.
3. On the target machine, run the .msi file using the following command line syntax.

   ```
   msiexec /i [path]\PackageStudio.msi /qn /l*v %temp%\PackageStudio.log
   ```

   You can add the following arguments if you want to specify locations other than the default directories:

   `REPOSITORY_ROOT=C:\Program Files (x86)\VMware\VCM\Tools\Repository\` (Defaults to this or uses the Repository's value if it is already installed)

   `PACKAGESTUDIO_DIR="C:\Program Files (x86)\VMware\VCM\Tools\Package Studio\"` (defaults to this path)

The Package Studio is installed to the location specified during installation. The default location is `C:\Program Files\VMware\VCM\Tools\Package Studio` (on 32-bit machines) or `C:\Program Files (x86)\VMware\VCM\Tools\Package Studio` (on 64-bit machines).

To start Package Studio, click **Start** and select **All Programs > VMware vCenter Configuration Manager > Tools > Package Studio**, or open the Package Studio folder and double-click **PackageStudio.exe**.

Manually Uninstall Package Studio

Using the following command line syntax, you can run an unattended uninstall the Package Manager.

Prerequisites

- To uninstall the application, you must use the same version of the PackageStudio.msi that was used to install the application.

Procedure

1. Copy the PackageStudio.msi to the machine on which you are uninstalling the application.

   You can also run it from a shared location.
2. Run the .msi file using the following command line syntax:

   ```
   msiexec /x [path]\PackageStudio.msi /l*v %temp%\PackageStudio.log
   ```

Install Package Manager for Windows

You must install the Package Manager for Windows on all Windows machines on which you are managing software provisioning. Package Manager is the application on the target machines that installs software packages.

Package Manager is run using command line options or using VMware vCenter Configuration Manager. The installation process installs Package Manager application files and creates a cratecache folder. Cratecache is the local folder to which software packages are downloaded before they are installed.

NOTE If you are using the Software Provisioning Components in conjunction with VMware vCenter Configuration Manager (VCM), do not install the Package Manager using the this procedure, it is installed as part of the VCM Agent.

Prerequisites

- Verify that the target machine meets the supported hardware, operating system, and software requirements. See *VCM Installation Guide* for currently supported platforms and requirements.

Procedure

1. Double-click `PackageManager.msi`.
2. On the Welcome page, click **Next**.
3. Review the license agreement, select the appropriate options to continue, and click **Next**
4. On the Installation Folder page, use the default path or click **Change** to modify the path, and then click **Next**.
5. On the Cache Folder page, use the default path or click **Change** to modify the path where downloaded packages are saved, and then click **Next**.
6. On the Ready to Install page, click **Install**.
7. On the Setup Complete page, click **Finish**.

The Package Manager and the cratecache folder are installed to the locations specified during installation. The default location is `C:\Program Files (x86)\VMware\VCM\Tools`.

Install Package Manager Using Unattended .MSI

You can run an unattended installation of Package Manager using command line syntax. Package Manager is the application on the target machines that installs software packages.

Prerequisites

- Verify that the target machine meets the supported hardware, operating system, and software requirements. See *VCM Installation Guide* for currently supported platforms and requirements.

Procedure

1. On your Collector, go to `C:\Program Files (x86)\VMware\VCM\AgentFiles\Products`.
2. Locate the `PackageManager.msi` file and copy it to the target machine.
3. On the target machine, run the `PackageManager.msi` file using command line syntax.

   ```
   msiexec /i PackageManager.msi /qn /l*v %temp%\PackageManager.log
   ```

   (Optional) You can add the arguments if you want to specify locations other than the default directories.

   `PACKAGEMANAGER_DIR="C:\Program Files (x86)\VMware\VCM\Tools\Package Manager for Windows\"` (defaults to this path)

   `LOCAL_CRATE_CACHE="C:\Program Files (x86)\VMware\VCM\Tools\cratecache"` (defaults to this path)

Manually Uninstall the Package Manager for Windows

You use the following command line syntax to run an unattended uninstall the Package Manager. To uninstall using the `PackageManager.msi`, you must use the same version of file that was used to install the application.

Procedure

1. Copy the `PackageManager.msi` to the machine on which you are uninstalling the application
2. Run the `PackageManager.msi` file using the following command line syntax:

```
msiexec /x PackageManager.msi /l*v %temp%\PackageManager.log
```

Using Package Studio to Create Software Packages and Publish to Repositories

3

Package Studio is the application used to build software packages for installation on target Windows servers and workstations.

Windows packages can include in-house and commercial software installation files, including .msi, .exe, VBScripts, python, PowerShell.

To add a software installer to a package, it must be able to install and uninstall unmanned or quietly using command line options, response files, or other similar methods.

Naming and Versioning Packages

When you are installing and uninstalling the software package, the name and version assigned to a software package has significant impact on package management. When creating packages, you should have a clear understanding of how package names and versions are used by the Package Manager when running install and uninstall actions.

As a manager of Windows software, you commonly work with installation files designed to install a specific publisher-provided version. A software package usually contains much more than just the installation files. In addition to the installation files, a software package can include command arguments, pre- and post-command scripts, and an assigned software signing certificate, any of which can be modified to optimize the process or to meet changing requirements. To account for all these variations in content, you must properly name and version your software packages.

Correct Naming Practices

When you use Package Studio to create a package to install an application, for example, SQL Server 2005, you will begin by creating a project (*.prj), and then configuring a package (*.crate file) that is generated locally and can be published to a repository. The name of the project is not required to adhere to the stricter naming conventions you should use for a published package. The name of the package is determined by the value in the Name text box located on the Properties tab.

When you are ready to make a package available by publishing it to a repository as a *.crate file, you must assign a package name that ensures correct package management. Package Manager uses the specified version when checking if a package is installed, when checking if a dependency is installed, and when uninstalling a package.

- The package name should not include the software version. For example, you should name the package containing SQL Server 2005 (version 9.00.1399.06) sqlserver, not sqlserver2k5.
- The package version specified in the Version field is used when you build the package in Package Studio. You should not include the version in the package name.
- The architecture on which the package might be installed is specified in the Architecture field when you build the package in Package Studio.

When the package is generated or published using the recommended naming (sqlserver), with Version and Architecture specified in the required fields, the file name is `sqlserver_9.00.1399.06_x86.crate`.

If you find you need to modify a package, for example, to update a command argument to optimize installation, you should then add a value to the package version number rather than to the package name, for example, 9.00.1399.06-b, to enable Package Manager to identify and process the revised version.

Correct Versioning Practices

The version is added to the file name when the .crate file is generated. For example, `sqlserver_9.00.4035.00_x86.crate`, where 9.00.4035.00 is the software publisher's assigned version number and is considered the UpstreamVersion as described below.

You must carefully determine the version of the package. The processing of dependencies will not work if you incorrectly version a package.

You can also assign more detailed version numbers. The format is <Epoch>;<UpstreamVersion>-<Version>.

- **Epoch:** (Optional) This value allows you to leave behind version numbering mistakes in older versions of the package or to leave behind previous versioning schemes. A valid value is a single small integer. If omitted, the value is assumed to be zero. Epoch can contain only integers. In the Epoch, 9 is a lower version than 10.
- **UpstreamVersion:** (Required) The primary version number. This value is usually the version of the application the package contains. The format is usually that of the package authors. However, you may need to reformat the value to fit your package management system format and comparison scheme. Valid UpsteamVersion characters are 0-9, a-z, A-Z, ; (semicolon), . (period), - (dash), + (plus), and ~ (tilde). If there is no Epoch, semicolons are not allowed. If there is no Version, dashes are not allowed.

  In the upstream version, you can use the publisher's version number. The following is an example of how version numbers are processed by Package Manager, lowest version to highest version:

  9 (earlier version)
  9A
  9AA
  9Aa
  9a
  9+
  9.0
  9.0.0.0
  9.00.0.0
  9~
  90
  90.0
  900 (later version)

Notice the order in which non-numeric characters are processed. Non-numeric characters are processed as a string based on their ASCII value. You should only use them if you know the ASCII value and understand the impact on the value of the version.

The easiest format to manage is the publisher's version.

- **Version:** (Optional) Provided to allow you to add package versions to the UpstreamVersion based on changes or edits to the base package. For example, you need to modify a command parameter to improve the installation process. Valid Version characters are 0-9, a-z, A-Z, . (period), - (dash), + (plus), and ~ (tilde).

  When you modify a package, perhaps to apply a new signing certificate, you should add a value to the version number, for example, -b (9.00.1399.06-b) to indicate this is a later package version than the 9.00.1399.06 version.

  Add this version with the same care you use with the UpstreamVersion. If you use non-numeric characters, they are processed as a string as described in the UpstreamVersion. The following list is an example, lowest to highest version.

  9.00.1399.06-A (earlier version)
  9.00.1399.06-B
  9.00.1399.06-a
  9.00.1399.06-b (later version)

A full version can look like the following example: 10;10.0.1600.22-b, where 10 is the Epoch, 10.0.1600.22 is the UpstreamVersion, and b is the Version (the package version rather than the application version).

Processing Package Names and Versions

When the command to install a package is issued to Package Manager, it evaluates packages for the name and for the version based on the operator (=, <, >, <=, or >=). The Package Manager checks the Control.xml file in the *.crate file for the Crate Name and the Version.

For example, a package identified as sqlserver, version 8.0-a, has been installed by the Package Manager. You issue a command to install "sqlserver >= 9.00.1399.06". Package Manager reviews its list of known software packages and determines that sqlserver, version 8.0-a is already installed. It then reviews the known repository sources and identifies available packages sqlserver, version 9.00.1399.06, and sqlserver, version 9.00.1399.06-b. It installs the highest version of which it is aware, in this example, sqlserver version 9.00.1399.06-b.

Project Naming, Package Naming, and Package File Naming

It is possible for the published package file name (*.crate) to be different from the suggested package file name, which is the package name as it appears on the package Properties tab, along with the version and architecture. This is usually as the result of the user changing the name of the package file from the suggested name when generating in Package Studio.

For example, you begin creating a new sqlserver package for 10.0.1600.22 (SQL Server 2008), where the Properties tab Name is sqlserver, and you save the project as `sqlserver2008.prj`. You continue working on the project, adding command arguments and pre- and post-command scripts. When it is ready to go into production, you **Generate** the package, changing the suggested file name, as it appears in the Generate Software Package for Windows dialog box to `prod-sqlserver_10.0.1600.22_x86.crate` so you can identify the production-ready version. The next day you are publishing this and other production-ready packages to a repository. You click **Publish > Existing** and select your existing

`prod-sqlserver_10.0.1600.22_x86.crate` file. You then complete the process of publishing it to the repository. The file is published to the `repository\crates\s` folder, but with a file name of `prod-sqlserver_10.0.1600.22_x86.crate`. However, the control.xml file contains the correct Crate Name, sqlserver, and the package is still processed by Package Manager as sqlserver, version 10.0.1600.22, x86 architecture.

Creating Packages

You use Package Studio to create packages, including the installation files and the required metadata. When the package is ready for use, you publish it to a repository. The procedure here is only a general process. See the Package Studio online Help for the detailed procedures.

Procedure

1. Start the VMware vCenter Configuration Manager Package Studio. Select **Start > All Programs All > VMware vCenter Configuration Manager > Tools > Package Studio**.

   NOTE If you are running Package Studio on a Windows 2008 Server, you must run the application as administrator. See "Run Package Studio as Administrator" on page 27 for more information.

2. Click **Manage Packages**. Configure the package contents based on the options on the following tabs:
   a. Click **Properties** and type a Name, Version, Description, and select the Architecture. These fields are required. You have the option to update the other fields, depending on you requirements.

      Configuring the package with Depends, Conflicts, Provides, and adding and configuring the installation and removal files.

      See the following for more information:

      - "Create Packages with Dependencies" on page 28
      - "Create Packages as Dependency Containers" on page 29
      - "Specify Package Conflicts" on page 31
      - "Specify Provides for Packages" on page 33

   b. Click **Files** and import the installation files, add pre-command files, configure the commands and arguments, and add post-command files. See "Add Commands, Arguments, and Scripts to Packages" on page 35 for more information.

   c. Click **Save** to save the setting and files as a Project (*.prj).

   d. Click **Generate** to save the project as a package (*.crate).

3. Click **Package Signing** and sign the package with a signing certificate. See "Sign Packages with Certificates" on page 36 for more information.
   a. Click **Open** to select a package (*.crate file).

   b. Click **Sign** and select a certificate from the certificate store or from a file.

4. Click **Manage Repositories** and select the platforms and sections to which you are publishing the package.

a. Click **Add Platforms** to add a platform. See "Add Platforms and Sections to Repositories" on page 44 for more information.

b. Select a platform, and then click **Add Sections**.

c. Select a section, and then click **Publish Package**. See "Publish Packages to Repositories " on page 45 for more information.

d. Select the package (.crate) and click **Open**.

e. (Optional) Select additional platforms and sections to which to publish the package.

f. Click **Publish**. The package is published to the software repository.

5. Click **External Software** and add externally managed software, especially any packages specified as depends or conflicts in any of your packages.

a. Click **New External Package** and replace the text with the name you will use as an external software package name.

b. Type a version number in the Version text box.

c. Select the **Architecture** in the drop-down list.

d. Click **Select Attribute Name** and select a registry property or WMI attribute in the drop-down list.

e. Add attributes. See "Define External Software Attributes" on page 50 for more information.

f. To save a copy locally, click **Save** .

g. Click **Publish External SW** to publish to the repository.

Run Package Studio as Administrator

If you install the Package Studio on Windows 2008 Servers, the enhanced security requires you to run the application as an administrator in order to publish packages to the repository.

NOTE You do not need to run Package Studio as administrator if your repositories were configured on non-UAC protected paths or when you are running Package Studio and the repositories on machines other than a Windows 2008 Server.

Procedure

1. On a Windows 2008 machines, select **Start > All Programs > VMware vCenter Configuration Manager > Tools**.
2. Right-click **Package Studio** and select **Properties**.
3. Click the **Compatibility** tab.
4. In the Privilege Level area, select **Run this program as an administrator** and click **Apply**.
5. Click **OK**.
6. Select **Start > All Programs > VMware vCenter Configuration Manager > Tools > Package Studio**.
7. On the User Account Control dialog box, click **Yes**.

Package Dependencies

Dependencies are used to identify and install prerequisite packages that must be installed before a software package is be installed. The packages on which a package is dependent on are specified on the Depends tab, located on the Properties tab, when you create the package.

For example, you need to install SQL Server 2005 SP3 on your servers with SQL Server 2005 in order to meet system requirements. You create a package for the service pack (sqlserversp) and include sqlserver >= 9.00.1399.06 as a dependency for the sqlserversp installation. When the sqlserversp package is installed, Package Manager checks for dependencies. In this example, sqlserver >= 9.00.1399.06 is a dependency. It then checks the installed packages on the target machine for sqlserver >= 9.00.1399.06 as an installed package. If Package Manager determines that the prerequisite package, sqlserver, is not installed, it downloads this package from the software repository and installs it. After the dependency is installed, Package Manager installs the files contained in the sqlserversp package.

You can also specify dependencies on applications that are not managed as packages and not installed using Package Manager by using External Software. If you added sqlserver, version 9.00.1399.06, to your external software application list, then the check for a dependency will begin with installed packages. If sqlserver is not found as an installed package, Package Manager then checks the external software list for an entry for sqlserver >= 9.00.1399.06. If it finds one, checks the attributes, verifies the application is installed, it considers the dependency met and continues with the installation of sqlserversp.

A best practice is to add any package you use as a dependency to the External Software list. This ensures that even externally installed software is processed by Package Manager at installation time. See "External Software Attributes" on page 47 for more information.

Create Packages with Dependencies

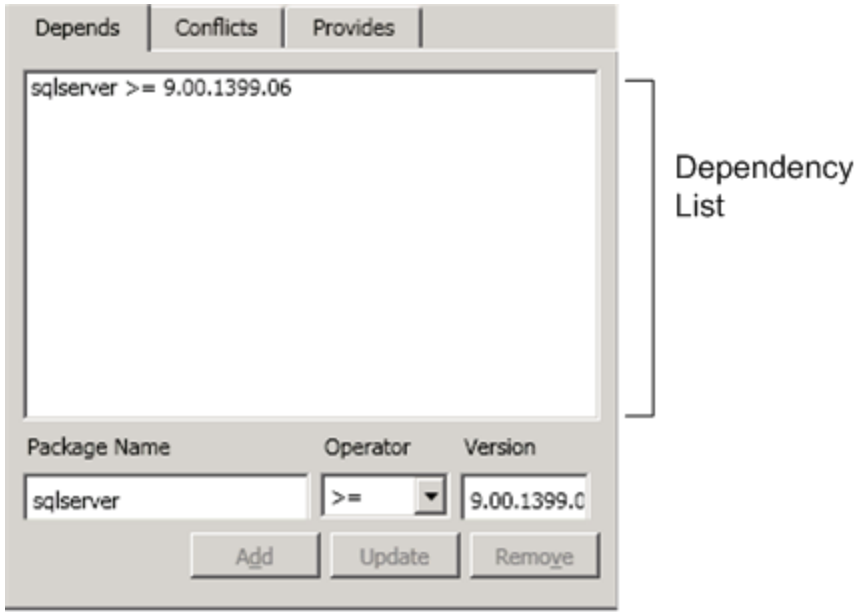
Using package dependencies, you specify prerequisites for the installation of the current package or to install several packages with one action.

Prerequisite

- Review "Package Dependencies" on page 27 to ensure you thoroughly understand how dependencies are processed at installation before adding them to a package.
- Verify that any specified dependency packages exist in the repositories. If the specified dependency packages do not exist in the repositories, the current package is not installed on the target machines.

Procedure

1. Start the VMware vCenter Configuration Manager Package Studio.
2. Click **Manage Packages**.
3. On the **Properties** tab, click the **Depends** sub-tab.



4. In the Package Name text box, type the name of the package.

   The package name typed in the text box must match the name of the package as it exists in the software repositories. For example, if you create a dependency for a sqlserver >= 9.00.1399.06, a package with the name sqlserver must exist in the repositories in order for the dependency to be met.

5. In the Operator drop-down list, select the operator used to specify the required version.
6. In the Version text box, type the version of the dependency package that must be installed before the current package is installed.
7. Click **Add**.

Package Dependency Containers

You can use package dependencies as a way to install several packages with one action. You can create packages without any installation files but containing multiple dependencies for all the software packages you want to install. This package serves as the container for multiple package dependencies.

The packages are specified on the Depends tab when you create the package. At the time of installation the Package Manager will review the installed packages it knows to be installed on the machine, identify any packages that are not yet installed, access the repository, locate the candidate packages, and then install the files.

During installation, the dependencies are not processed in the order they appear in the list. If you need packages to install in a particular order, you should "chain" the packages. For example, if antivirus must be installed before backuptools, you should make antivirus a dependency of backuptools rather than including it as a dependency in the current package.

Create Packages as Dependency Containers

You can create a package to serve as dependency container. This type of package specifies multiple dependencies but does not include any installation files.

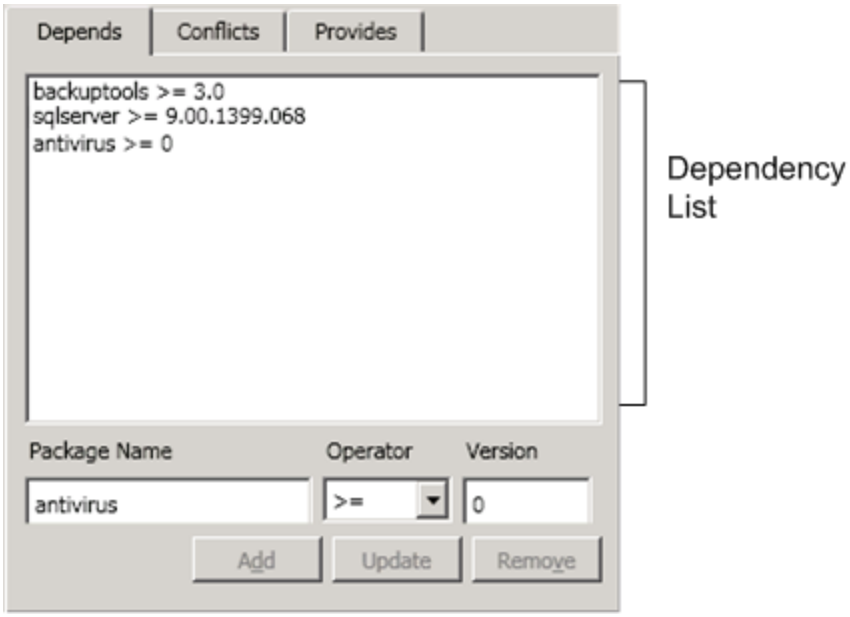
In the following procedure a collection of packages are added to one package to install on a newly configured server. The dependency packages are backuptools, sqlserver, and antivirus.

Prerequisites

- Review "Package Dependency Containers" on page 29 to ensure you thoroughly understand how dependency container packages are processed at installation.
- Verify that any specified dependency packages exist in the repositories. If the specified dependency packages do not exist in the repositories, the current package is not installed on the target machines.

Procedure

1. Start the VMware vCenter Configuration Manager Package Studio.
2. Click **Manage Packages**.
3. On the Properties tab, click the **Depends** sub-tab. (Examples of other dependencies, such as Conflicts or Provides are described later and in the online Help.)



4. In the Package Name text box, type the name of the package.

   The package name must match the name of the package as it exists in the repositories. For example, if you create a dependency for a backuptools>= 3.0, a package with the file name backuptools_<version equal or later than value>_<architecture> must exist in the repositories in order for the dependency to be met.
5. In the Operator drop-down list, select the operator used to specify the required version.
6. In the Version text box, type the number of the version required to calculate the dependent version.
7. Click **Add**.
8. Add other dependencies as needed.

Package Conflicts

Some software applications adversely affect other software applications when they are installed on the same machine. When creating a software package, you can specify the names of packages that conflict with the package you are creating. Then, during installation, if a conflicting package is found on the target machine, the current package is not installed.

For example, installing McAfee and Norton antivirus on the same machine is known to cause conflicts in your environment. When creating a software package for each, you can specify the opposing package name on the Conflicts tab of each package. Then, when installing the mcafee package, Package Manager looks at the specified conflicts for the package. If norton is listed, it reviews the installed software package list to determine if norton is installed. If norton is installed, mcafee is not installed. If norton is not installed, the mcafee installation proceeds.

You can also specify conflicts on applications that are not managed as packages and not installed using Package Manager by using External Software. Then, when installing the mcafee package, Package Manager looks at the specified conflicts for the package. If norton is listed as a conflict, it reviews the installed software package list to determine if norton is installed. If norton is not installed, it then checks the external software application list and determines if it is installed. If norton appears as installed as either an installed package or as an installed external software application, mcafee is not installed. If it is determined that norton is not installed, the mcafee installation proceeds.

A best practice is to add any package you specify as a conflicts to the External Software list. This ensures that even externally installed software is processed by Package Manager at installation time. See "External Software Attributes" on page 47 for more information.

Depending on the application, it is possible to install multiple versions of the software on a machine with no ill effects, while other applications will not work properly if there is more than one version installed. Using conflicts, you can specify that a package should not be installed if a previous version is installed. For example, you currently have version 2 of a package installed, and you want to install version 3. You specify in the version 3 package that it conflicts with version 2. During the installation of version 3 you are informed that version 2 conflicts with version 3. You uninstall version 2, and then run the version 3 installation again. This time, not finding the conflicting package, it will install version 3. When version 4 is released, you specify in the version 4 package that it conflicts with version 2 and version 3. Then, if either version 2 or 3 is currently installed, you are notified of the conflict and can then uninstall the older package before installing version 4.

Specify Package Conflicts

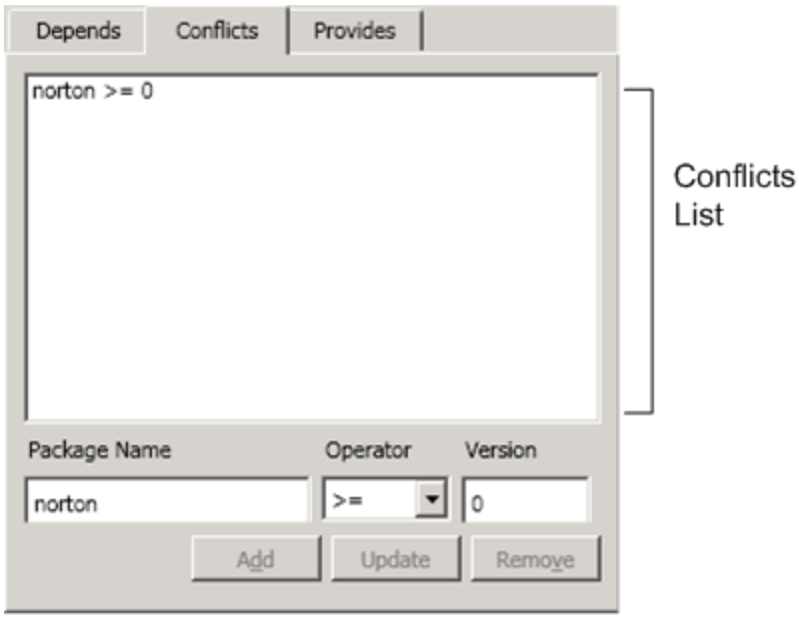
You specify package conflicts to avoid installing a software package on a machine where it will adversely affect other software packages. If, during package installation, a specified conflicting package is determined to be installed, the current package is not installed.

Prerequisites

- Review "Package Conflicts" on page 30 to ensure you thoroughly understand how package conflicts are processed at installation.

Procedure

1. On the Properties tab, click the **Conflicts** sub-tab.



2. In the Package Name text box, type the name of the package.

   The package name in the text box must match the name of the package as it exists in the software repositories.

3. In the Operator drop-down list, select the operator used to specify the conflcting version.
4. In the Version text box, type the number of the version required to calculate the conflicting version.

   If all versions conflict, type zero (0).

5. Click **Add**. The value is added to the dependency list.
6. Add other dependencies as needed.

Package Provides

Provides indicates that a package provides another application when the main application is installed or that a package provides a type of functionality.

Provides the Application

The package you are creating also installs another application; it provides the other application.

For example, SQL Server 2008 (sqlserver) installs .Net 3.5.1, so you can add dotnet to the package properties Provides tab. Assuming that sqlserver is then installed on a machine, and you later install a package where a dependency on dotnet => 3.0 was configured, Package Manager first looks to see if a dotnet => 0 was installed. If not found, it checks installed packages to determine if any provide dotnet. If it finds the sqlserver package is installed with a Provides value of dotnet, it considers the dependency met and installs the package.

Provides a Type of Functionality

You want to classify the package you are creating as an general application type; it provides a type of functionality.

When using Provides to specify a type of functionality you are specifying that it provides a logical package rather than a concrete package. This logical package name is a generic name applied to any one of a group of packages, all of which provide similar functionality.

For example, you create a package for McAfee (mcafee) where the Provides tab is configured with the logical package name of antivirus and the Conflicts is configured with norton. You then create a package for Norton (norton) where the Provides tab is configured with the logical package name of antivirus and the Conflicts tab is configured with mcafee.

You now have two packages configured to provide anitvirus as a logical package. Now, when you create a Cisco VPN package (cisco-vpn), which requires some form of antivirus be installed first, you specify antivirus >= 0 on the Depends tab.

During the installation of the cisco-vpn package, the process first checks dependencies. It sees a dependency for antivirus =>0. It reviews the installed packages. If no antivirus package is identified, it checks installed packages to determine if any provide antivirus. If found, it considers the antivirus Depends criteria has been met and installs. If not found in any installed packages, it reviews the repository packages for a package named antivirus. If not found, the installation stops and a message tells you that cisco-vpn depends on antivirus, and antivirus could not be found. You install mcaffee or norton, and then retry the install of cisco-vpn. This time the cisco-vpn install will find the provided antivirus and the installation will continue.

Specify Provides for Packages

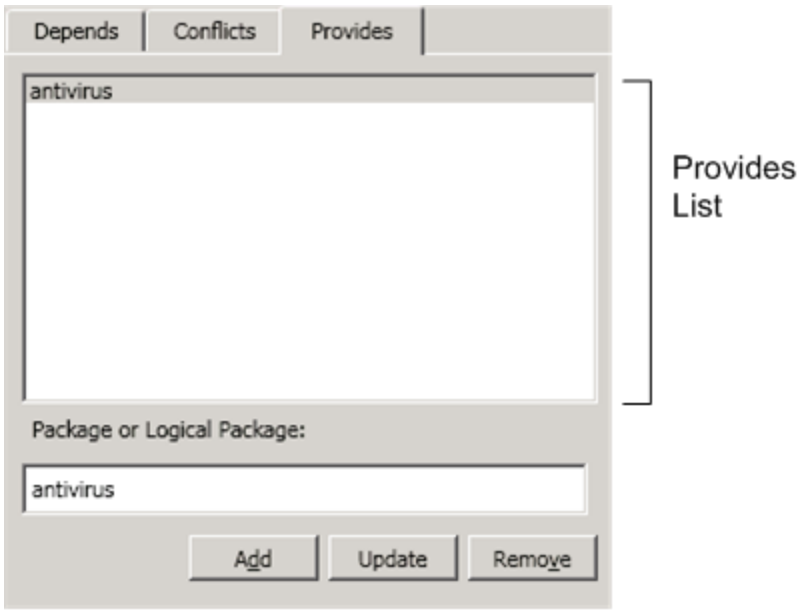
You use provides to indicate that a package provides another application when the main application is installed or that a package provides a type of functionality.

Prerequistes

- Review "Package Provides" on page 32 to ensure you thoroughly understand how provides are processed at installation.

Procedure

1. On the **Properties** tab, click the **Provides** sub-tab.



2. In the **Package or Logical Package** text box, type the name of the package or functionality type. Use lower case. Although the text box allows you to use mixed case, the dependencies and conflicts will process only lower-case names.
3. Click **Add**.
4. Add other Provides as needed.

Package Commands, Arguments, and Scripts

When you create packages, you must consider the unique command, argument, and pre- and post-command script requirements of each application.

Referencing Response Files Using System Environment Variables

Some software installations require a response file during the install process. To accommodate the need for a response file you can add the `%CrateWorkingDirectory%` system variable to your arguments when you configure the installation and removal options.

For example, you are creating a package where the .msi requires a response file named `settings.ini`. You include the `settings.ini` file in your Project Data Directory files, and then configure the Arguments with the correct reference. In this example, the Argument is `/q settings="%CrateWorkingDirectory%\Data\settings.ini"`.

The value `%CrateWorkingDirectory%\Data\` is required, after this value you add any subdirectories that exist in your Project Data Directory. For example, the settings.ini may be in a folder named InstallSettings, in which case the argument is `/q settings="%CrateWorkingDirectory%\Data\InstallSetting\settings.ini"`.

When the package begins installing, the referenced files are downloaded to the target machine's TEMP directory, and then processed by the .msi.

Referencing License Files

The use of license files in the package command line options varies between applications. Some can be referenced in a shared location, using the system environment variables described above, or included in a .bat file, while others may be applied on a user-by-user basis. Consult the product publisher's documentation for the application for which you are creating a package to determine how you can include the information in the package.

Add Commands, Arguments, and Scripts to Packages

To use Package Manager to install and remove packages, you must configure the Files tab with the appropriate commands, arguments, and optional pre- and post-command scripts to be run before and after the installation command. Consult the documentation issued for the application for which you are creating a package when configuring the Files tab options.

Prerequisites

- Review "Package Commands, Arguments, and Scripts" on page 34 to ensure you thoroughly understand how to the commands, arguments, and scripts are processed at installation.
- Installation and removal files are accessible to Package Studio users.
- Optional pre- and post-command scripts are accessible to Package Studio users.

Procedure

1. Click the **Files** tab.
2. In the **Select Files to Import** area, click **Select Folder**.
3. On the Browse for Folder dialog box, locate the folder containing the files to include in the package and click **OK**.
4. Click **Import Files Into Project**.

   The contents of the folder specified in the file path text box are added to the project and the file and sub-folders are displayed in the Project Data Directory area.
5. (Optional) To add, remove, or rename the files in the folder, click the **Folder** button. The folder contents are displayed. When the folder contents are properly organized, close the window.
6. To update the displayed files, click the **Refresh** button.
7. In the process type drop-down list, located above the Pre-Command File label, select **Installation**.
8. To specify a script to run before installation, for example, to shut down a service, click **Add** on the **Pre-Command File** line.

   Browse to the location of the pre-command executable file type. The file required by Package Studio begins preinst*.*. To see all files, type *.* in the File name text box. Click **Open** to select the file. The file is renamed preinst.<extension> and is displayed after the **Pre-Command File** label.
9. If the command used to run the installation is displayed in the Project Data Directory, select the .exe or .msi, and then click **Set Command**.

   You may also type the command in the text box. The **Command** text box must display the name of the command to be run, it does not have to be a command from the file list.
10. In the **Arguments** text box, type the arguments you want to apply to the installation process when it runs.

Separating the arguments from the command allows for consistent behavior and better tracking of results.

11. (Optional) To specify a script to run after installation, for example, to restart a service, click **Add** on the **Post-Command File** line.

    Browse to the location of the post-command executable file type. The file required by Package Studio begins postinst*.*. To see all files, type *.* in the File name text box. Click **Open** to select the file. The file is renamed postinst.<extension> and is displayed after the **Post-Command File** label.

12. (Optional) Select **Force Reboot after command** if the package requires a reboot after installation.

    IMPORTANT If you select this option, the target machines will reboot after installation of the current package without regard to time of day, state of the machine, or other factors.

13. To configure the associated removalcommand, repeat the above process after selecting **Removal** in the drop-down list.

    The files, commands, arguments, and pre- and post-command options may all be different for each of the actions.

Using Signing Certificates with Software Packages

Signing packages is an optional function. However, you should consider signing software packages as a common best practice for proper network security, ensuring the packages are from an authorized source and have not been altered since they was published before installing them on your machines. If you are unfamiliar with certificates, have a network administrator who is familiar with certificate management assign you one with a private key. You can publish unsigned packages to repositories, but this is not recommended.

If you are familiar with certificates, and decide to sign packages, you must be able to meet the following prerequisites in order to sign and install packages:

- You use a signing certificate from a trusted certificate.
- You use a signing certificate with a private key.
- You must have access to the signing certificate's private key when signing a package. Access can be to the Certificate Store containing the certificate, an exported .pfx file of the certificate, or an exported .pvk file of the certificate.
- The public key of the signing certificate you used to sign a package is available on all the machines on which you are installing packages.

Using a certificate with an expiration time will require you to generate and publish revised packages after the certificate expires. If the certificate passes the expiration time, the packages must be individually edited to point to a different and valid certificate, or new packages must be created.

Sign Packages with Certificates

You have the option to use a certificate to sign the packages you create. For more information about certificates, see "Using Signing Certificates with Software Packages" on page 36.

Prerequisites

- You use a signing certificate from a trusted certificate.
- You use a signing certificate with a private key.
- You must have access to the signing certificate's private key when signing a package. Access can be to the Certificate Store containing the certificate, an exported .pfx file of the certificate, or an exported .pvk file of the certificate.
- The public key of the signing certificate you used to sign a package is available on all the machines on which you are installing packages.

Procedure

1. Click **Package Signing**.
2. If you do not have a package open, click **Open**.
3. On the Browse for Package dialog box, locate the *.crate file you are signing, and then click **Open**.

   The path and file name are displayed after **Package**, located below the toolbar.
4. Click **Sign**.

   The **Select Signing Certificate** dialog box appears.
5. Select one of the following options, and then click Browse:
   - **Select signing Certificate from Windows Certificate Store**
     a. The **Browse for Signing Certificate** dialog box appears, displaying the contents of the Windows Certificate Store.
     b. Locate the appropriate signing certificate in the store. It must have a private key. To limit the displayed certificates to only those with private keys, click the top nodes in each of the displayed trees, Current User and Local Machine. Only the certificates with private keys are displayed.
     c. Click **Select**.

        The certificate is added to the text box on the **Select Signing Certificate** dialog box.
   - **Select signing certificate from file (.pfx, .pvk)**
     a. The **Browse for Signing Certificate** dialog box appears, displaying certificate files.
     b. Locate the exported certificate *.pvk or *.pfx file.
     c. Click **Open**.

        The certificate is added to the text box on the **Select Signing Certificate** dialog box.
6. Clear or select the **Requires Password** check box, depending on whether the selected certificate file has a password.

   If you select the check box, type the password in the text box.
7. Click **Select**.

Review the **Package Signature and Security Status** area for the values indicating successfully signed packages.

- **Package Signing:** Signed
- **Signature Validation:** Valid
- **Package Validation:** Valid

Editing Packages

You can either edit the project (*.prj) from which you originally created a package (*.crate) file or create a new project based on an existing package (*.crate) file.

You cannot directly edit a package, you can only edit a project. When the project contains your changes, you first generate a package (*.crate), and then you publish it to the your repositories; however, you must be careful to properly version the new package to ensure that Package Manager can process it correctly when installing or uninstalling the package.

Editing Published Packages

After publishing a package, you may need to modify one or more of the settings to improve performance or to adapt the package to changing system needs. For example, the dependencies or arguments for installation must change in order to accommodate new company requirements.

To edit, either open an existing project or create a new project from an existing .crate file, generate the revised .crate file, and then publish the revised version of the package to the repositories.

Best Practices

When editing a project, you should use the following best practices:

- When you generate a new package from a project, you should modify the version, located after the UpstreamVersion in the version format. For example, if the previous version was 3.5.1-a where "-a" is the local package version, change the version to 3.5.1-b, indicating this is a revision of the package rather than the version of the application you are installing.
- Never unpublish a package from a live repository. Unpublishing disables Package Manager ability to run removal actions. Unpublish also disables Package Manager's awareness of version changes.

Edit Published Packages

After publishing a package, you may need to modify one or more of the settings to improve performance or to adapt the package to changing system needs. For example, the dependencies or arguments for installation must change in order to accommodate new company requirements.

To edit, either open an existing project or create a new project from an existing .crate file, generate the revised .crate file, and then publish the revised version of the package to the repositories.

Best Practices

When editing a project, you should use the following best practices:

- When you generate a new package from a project, you should modify the version, located after the UpstreamVersion in the version format. For example, if the previous version was 3.5.1-a where "-a" is the local package version, change the version to 3.5.1-b, indicating this is a revision of the package rather than the version of the application you are installing.
- Never unpublish a package from a live repository. Unpublishing disables Package Manager ability to run removal actions. Unpublish also disables Package Manager's awareness of version changes.

Prerequisites

- The package to be used as the base package is saved as a project (*.prj) or as a generated package (*.crate) saved locally, and the files are available to Package Studio user.

Procedure

1. Click **Manage Packages**.
2. Use one of the following methods, depending on the type of file with which you want to work.
   - **Project (*.prj):**
     a. Click **Open**. The **Choose a project** dialog box appears.
     b. On the Choose a project dialog box, select the project (*.prj).
     c. Click **Open**.

     The Properties, Files, and Signing tabs now display the settings of the source project.
   - **Package (*.crate):**
     a. Select **New > Project from Package**. The **New Project** dialog box appears.
     b. On the New Project dialog box, in the Project Name text box, type a name that will be saved as a .prj file.
     c. Specify the Project Directory.
     d. Click **OK**.
     e. On the Choose a package dialog box, browse to the location of the .crate file you are editing.

     You can use a local copy or browse to a repository if there is not a copy save locally.
     f. Click **Open**.

     The Properties, Files, and Signing tabs now display the settings of the source package.
3. Make any necessary changes, for example, add a command line argument or post install script.
4. On the **Properties** tab, update the **Version**. The best practice is to add or modify the package version, after the UpstreamVersion in the version format. For example, if the previous version was 3.5.1-a where "-a" is the local package version, change the version to 3.5.1-b, indicating this is a revision of the package rather than the version of the application you are installing.
5. Click **Save**.

   Saving the .prj file provides a backup of the package settings. .
6. Click **Generate**.

   Generating the .crate file provides a copy of the package that you can publish now or later, and edit again if necessary.
7. In the Generate Software Package for Windows dialog box, browse to the location of your saved packages (*.crate files), and then click **Save**.

   The new version and architecture are automatically appended to the file name.
8. Click the **Manage Repositories** tab and select a section in a platform to which you are publishing the package.
9. Click **Publish Package**.
10. On the Choose a Package dialog box, select the .crate file to publish, and then click **Open**.
11. On the Publish a Package dialog box, select the platforms and sections where you want the package categorized.

    See "Repository Platforms and Sections" on page 43 for more information.
12. Click **Publish**.

The package is added to the repository. If it published to repository source already added to Package Manager, the package is immediately available for installation.

Create New Package from Existing Projects or Packages

It is sometimes easier to create a new package from an existing project or package, allowing you to leverage existing configuration settings. For example, a new software version is issued. When researching the changes, you determine that the installation command information is the same for new software as it was for the previous version. In this case it may be faster to use the previous package as the base for the new package. You would need to change the version, the description, and the installation files, but you can use all the dependencies, and the pre- and post-commands.

Prerequisites

- The package to be used as the base package is saved as a project (*.prj) or as a generated package (*.crate) saved locally, and the files are available to Package Studio user.

Procedure

1. Click **Manage Packages**.
2. Use one of the following methods, depending on the type of file with which you want to work.
   - **Project (*.prj):**
     a. Click **Open**. The **Choose a project** dialog box appears.
     b. On the Choose a project dialog box, select the project (*.prj).
     c. Click **Open**.

     The Properties, Files, and Signing tabs now display the settings of the source project.
   - **Package (*.crate):**
     a. Select **New > Project from Package**. The **New Project** dialog box appears.
     b. On the New Project dialog box, in the Project Name text box, type a name that will be saved as a .prj file.
     c. Specify the Project Directory.
     d. Click **OK**.
     e. On the Choose a package dialog box, browse to the location of the .crate file you are editing.

     You can use a local copy or browse to a repository if there is not a copy save locally.
     f. Click **Open**.

     The Properties, Files, and Signing tabs now display the settings of the source package.
3. On the Properties tab, update the Version and the Description so you can continue to track the changes to the package.
4. On the Files tab, modify files, commands, and scripts as needed.
5. Click **Save**.

   Saving the .prj file provides a backup of the package settings. .
6. Click **Generate**.

   Generating the .crate file provides a copy of the package that you can publish now or later, and edit again if necessary.

7. In the Generate Software Package for Windows dialog box, browse to the location of your saved packages (*.crate files), and then click **Save**.

   The new version and architecture are automatically appended to the file name.

8. Click the **Manage Repositories** tab and select a section in a platform to which you are publishing the package.
9. Click **Publish Package**.
10. On the Choose a Package dialog box, select the .crate file to publish, and then click **Open**.
11. On the Publish a Package dialog box, select the platforms and sections where you want the package categorized.

    See "Repository Platforms and Sections" on page 43 for more information.

12. Click **Publish**.

The package is added to the repository. If it published to repository source already added to Package Manager, the package is immediately available for installation.

Using Software Repository for Windows 4

Software Repository for Windows is the shared location to which packages are published by Package Studio and the location from which Package Manager downloads packages for installation.

You manage the contents of repositories with Package Studio and specify the repository sources, the platforms and sections, from which to install or remove software packages using Package Manager.

Repository Platforms and Sections

When you publish a package to a repository, you specify one or more platforms and sections. Platforms and sections are the hierarchy used to organize software in repositories.

To publish packages to a repository, you must define at least one platform. Each platform must include at least one section.

Platforms

The platform value can be used to define the operating system architecture on which the package can be installed. In other repository systems, such rpm, it is common for the platform to represent the operating system architecture.

Package Manager does not detect the architecture of the operating system on which it is running and it is therefore unable to automatically identify the platform version required for installation on the target machine. It is up to you to specify the packages based on well-defined platforms in repositories.

Create and use platforms to help manage your software package distribution based on the operating system platforms on which they can be installed. When you use a greater level of specificity, it will result in smaller groups of packages and will increase the predictability of what packages are installed.

Providing consistent naming across all repositories is important to successfully managing multiple repositories and installing packages.

For example, you may specify platforms as follows:

- Any
- Any_32
- Any_64
- Win2k3
- Win2k3_32
- Win2k3_64

By including the 32- and 64-bit references in the platform names, you will be better able to ensure the correct version of package is installed on target machines.

Sections

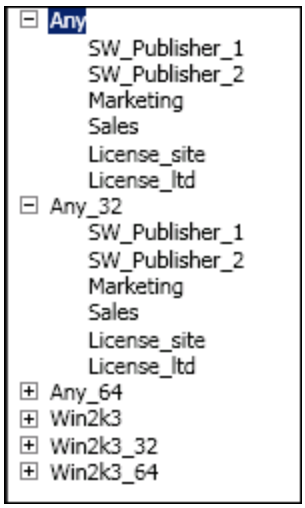
Sections are used to further refine how your packages are organized in each platform. Sections are used to specify the repository sources for Package Manager, allowing you to control which packages are available to which machines.

How you use sections can be adapted to your particular business needs. The following are examples of how you can use sections:

- **Business Groups:** Marketing, sales, front office, back office, research and development.
- **Development State:** In development, testing, production.
- **Traditional IT Software Management Structure:** Software publisher, department (business groups), license type (limited or site license).

Sample Platforms and Sections

The following example uses the suggested platform organization and a version of the traditional IT software management structure.



In VMware vCenter Configuration Manager Package Studio, the platforms and sections displayed on the Manage Repositories tab are based on your [path]\<your repository name>\.hive\repository.toc file. You can edit the file contents directly if you are configuring an initial repository with detailed structure.

Add Platforms and Sections to Repositories

You add platforms and sections to repositories using the Manage Repositories tab, and then you publish packages to the repository sections. See "Repository Platforms and Sections" on page 43 for more information regarding best practices when creating platforms and sections.

Procedure

1. Start the VMware vCenter Configuration Manager Package Studio.
2. Click the **Manage Repositories** tab.
3. Select your Repository Host in the drop-down list.
4. Select the Repository in the drop-down list.

   If you previously added platforms and sections to the repository, the tree view pane will display the names in a tree view. If this it the first time you have worked with this repository, the left-hand pane is blank.
5. Click **Add Platform**.
6. In the Add Platform dialog box, type a name and click **OK**.

   The platform is added to the tree view.
7. Select the platform and click **Add Section**.
8. In the Add Section dialog box, type a name and click **OK**.

   The section is added below the selected platform in the tree view.

Continue adding sections to a platform, or add more platforms and sections. After creating the platforms and sections, you can now publish your packages.

Publish Packages to Repositories

When you publish packages to a repository, the packages are available to the Package Manager to add as a source. The Package Manager is the application that manages the installation and removal of packages on target machines.

Prerequisites

- You have generated one or more packages (*.crate files) that you are ready to publish to your repository. See "Creating Packages" on page 26 for information about creating and generating packages.

Procedure

1. Start the VMware vCenter Configuration Manager Package Studio.
2. Click the **Manage Repositories** tab.
3. Select your Repository Host in the drop-down list.
4. Select the Repository in the drop-down list.

   If you previously added platforms and sections to the repository, the tree view pane will display the names in a tree view. If this is the first time you have worked with this repository, the left-hand pane is blank. For more information about adding platforms and sections, see "Add Platforms and Sections to Repositories" on page 44.
5. Select a section to which you are adding a package.
6. Click **Publish Package**.
7. In the Choose a package dialog box, select the .crate file to add to the section.
8. Click **Open**.
9. In the Publish Package dialog box, select the check boxes for any additional platforms and sections, and then click **Publish**.

The package is added to the selected platforms and sections, and the package information is displayed in the packages list.

If the section is identified as a source to the Package Manager or in VCM, the new package is now available. To add sources, see "Add Repository Sources " on page 53.

Using External Software

5

External Software is software not installed and managed by the Package Manager. It is either already installed before you begin managing software with Package Manager, or it is software you choose to install individually.

External Software Attributes

External Software is used to define the attributes by which software that was not installed by Package Manager as part of a package is identified on target machines.

Identifying externally managed software is required to ensure the proper processing of dependencies and conflicts when a package is installed on a machine where software was not installed by Package Manager. If external software is not properly identified, you may install a second copy of an application because it was specified as a dependency in a package, or you may install a package on a machine where externally installed software was identified as conflicting with the package.

When adding entries to the external software list, the naming of the applications follows the same naming conventions as a regular package (`<externalpackagename>_<version>_<architecture>`), but each one contains one or more user-defined attributes rather than files. Once added to the list, the entries are referred to in this documentation as external software packages.

External software package attributes serve as external package definitions. Each attribute consists of an attribute name and value. The name is selected from the drop-down list, and the value is added to the text box.

When the external software list is published to the repository, the file name is Repository.options. The file is published to the .hive folder in the repository files. Each repository can contain only one `Repository.options` file. Therefore, the published Repository.options file list should contain definitions of all the applications you are using as dependencies and specifying as conflicts for software packages managed by the repository.

External Software Best Practices

When you add a dependency or specify a conflict in any package, you should define the external software attributes for each depends or conflicts package. This practice ensures that machines where applications are already installed will be properly processed by Package Manager at installation time.

If an application has not been defined in the external software list and it was not installed by Package Manager, the following may occur:

- **Depends:** Package Manager will install a second copy of an application when it is specified as a dependency.
- **Conflicts:** Package Manager will install a package even though an externally installed application exists on the machine that is specified as conflicting with the package being installed.

To avoid these undesirable results, you should add all externally managed software to the External Software list, paying particular attention to packages specified as depends or conflicts in your packages, and continue to publish updated versions to the repository to ensure Package Manager has the most current list to reference when processing dependencies and conflicts during installation.

Adding Applications to an External Software List

Consider adding existing applications to your External Software list under the following circumstances:

- You begin using software provisioning to install packages on machines already in use. Adding previously installed applications to the External Software list and then publishing it to the repository provides the mechanism by which Package Manager can verify the existence of the application on the target machine. It makes applications not installed as packages visible to Package Manager, reducing the need to re-install applications installed outside Package Manager.
- You add dependencies to applications installed outside Package Manager. Even on a machine on which only the basic operating system is installed, you will have certain applications that are already installed, for example, Internet Explorer. Identify the applications, add them to the External Software list, and publish the list to the repository used by the machines.

Naming and Defining External Software Packages

When creating the name for the external software package (<New External Package>), apply the same naming considerations you used when naming packages. By using the same naming conventions, you ensure that Package Manager can process the defined external software "packages" as if they were actual packages, even though they contain only attributes to check rather than installation files.

See "Naming and Versioning Packages" on page 23 for more information.

Defining External Software Attributes

The list of attributes displayed in the Attribute Name drop-down list is based on values in the uninstall registry keys, located in `HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall` (on 32-bit machines) or `HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Microsoft\Windows\CurrentVersion\Uninstall` (on 64-bit machines) and on properties defined in Windows Management Instrumentation (WMI) for installed software. When creating attributes, make certain that the value entered in the Value text box correctly matches the expected value for the application on the target machines.

Managing External Software Lists

Although you can create more than one external software list, you can publish only one version of the list to a repository. After creating an initial list, add to the existing list rather than publishing a new list. If you publish a new list to a repository, it overwrites the `Repository.options` file.

Processing External Software During Installation

When you install a software package, the Package Manager processes the External Software list in the order described below.

Example Process Workflow Assumptions

In the following example it is assumed that some of your target machines have SQL Server 2005 SP3 already installed by means other than the Package Manager. As you begin using software provisioning to manage software on your machines, you should define a new external software package for sqlserver, using the appropriate version number to represent the service pack. This external software package name matches the name of the other sqlserver packages containing installation files for various versions.

- You added the following application definition to the External Software list and published it to your repository (as an entry in Repository.options) based on the following example:
  - Application name = sqlserver
  - Version = 9.3.4035.00
  - Architecture = x86
  - Attributes and Values are:
    - InstallLocation = C:\Program Files (x86)\Microsoft SQL Server\
    - VersionMajor = 9
- Using Package Manager, create a package (named serversetup in this example) containing a dependency for sqlserver >= 9.0
- The `Repository.options` file is published to repositories

Example Process Workflow

1. Package Manager is commanded to install serversetup.
2. Package Manager checks the dependencies in the serversetup package and determines that there is a dependency on sqlserver equal to or later than version 9.0.
3. Package Manager checks the installed packages list to determine if a package meeting the criteria has been installed.
   - If yes, it considers the dependency met and proceeds with the other serversetup installation requirements.
   - If no, it checks the external software list as defined in the `Repository.options` file.
4. Package Manager checks the external software list.

   If the name sqlserver, version 9.0 or later entry is found in `Repository.options`, Package Manager then checks the specified attributes on the machine. In this example, it checks that `HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall` contain a registry key with properties where `InstallLocation = c:\Program Files (x86)\Microsoft SQL Server\` and `VersionMajor = 9`.
   - If the two attributes match, it considers the dependency met and proceeds with the other serversetup installation requirements.
   - If one or more the attributes do not match, it checks the assigned repository sources for an available package meeting the criteria.
5. Package Manager checks the available package list for a managed software package.

- If it locates an available package meeting the criteria, sqlserver equal to or later than version 9, it installs the package and considers the dependency met. Package Manager then proceeds with the other serversetup installation requirements.
- If it does not locate a package meeting the criteria, the serversetup package is not install. It cannot be installed until the dependency for sqlserver equal to or later than version 9.0 is met.

Define External Software Attributes

When defining external software to be used for dependencies or conflicts processing, you either create a new list or open and add to an existing list.

Prerequisites

- Review "External Software Attributes" on page 47 to ensure you thoroughly understand how external software attributes are processed at installation before you add them to a list.
- You have identified software already installed using the publishers installer, not Package Manager, on one or more machines in your network.

Procedure

1. Start the VMware vCenter Configuration Manager Package Studio.

   The default location on the Collector is `C:\[installation location]\VMware\VCM\Tools\Package Studio\PackageStudio.exe`.

2. Click **External Software**.

   By default, a blank list appears. If you are adding to an existing list, click **Open** and browse to the existing list you are editing. The saved file is `<filename>.options`.

3. Click **<New External Software>** and replace the text with the name you want to be treated as the external software package name using the same naming conventions used for all package names. For example adobeacrobatereader.
4. Type the version number in the Version text box.
5. Select the application architecture in the Architecture drop-down list.
6. Click **<Select Attribute Name>** and select a registry property or WMI attribute in the drop-down list.
7. Replace <New Attribute Value> with the exact string to match when verifying the value exists.
8. To add another attribute, click the green plus button.

   A new attribute row is added.

   Continue defining as many attributes as required to verify presence of the application on the target machine.

9. To define another application, click **Add** (located below the list) and repeat the process.
10. To save a copy locally, click **Save**.
11. In the Save Repository Options dialog box, save the file with a locally unique name without changing the `.options` extension and click **Save**.

The default save location is `My Documents/Package Studio`.

12. To publish the list to a repository, click **Publish External SW**.
13. In the Publish Options dialog box, select a **Repository Host** name in the drop-down list.
14. Select a **Repository** name in the drop-down list.
15. Click **Publish**.

The file is published to your repository in the .hive folder as `Repository.options`.

Using Package Manager for Windows 6

Package Manager is the application installed on each machine to manage the installation and removal of the software contained in packages. Package Manager is configured to use one or more repositories as sources for packages.

The effective use of Package Manager requires proper creating packages and deploying the packages to repositories to which target machine has the necessary access.

Processing Dependencies

Working with packages, Package Manager is able to process the dependencies, Depends, Conflicts, Provides, ensuring you do not install software on a machine that has negative results for the machine users or affects the processes it runs.

For example, you have a machine where Package A is installed. You use Package Manager to install Package B. The processing of the package includes checking the dependencies. In this example, Package B is configured with a Conflicts with Package A. The installation does not proceed and the Package Manager informs you of the conflict.

Security

As a security measure, Package Manager assumes that all packages must be signed with a private key before they are installed or uninstalled. To accommodate organizations that do not use software signing or where the immediate circumstances require you to ignore that signature, override options are provided.

Add Repository Sources

A repository source is a section under a platform in a repository. Adding platforms and sections to the repository allows you to control which repository sources the Package Manager for Windows uses when installing and removing software. For example, a repository may contain platforms with both test sections and release sections, but by making Package Manager aware of only the release sections, you ensure that packages still in the testing phase are not added to the repository list and are therefore not available for installation.

Additionally, you can add sources from more than one repository, and you can specify the order in which the repository sources are queried.

The repository source list to which you are adding sources is repository.xml, located in `C:\Documents and Settings\All Users\Application Data\VMware\Wasp` on each managed machine.

Prerequisites

The platforms and sections are defined in the repositories for which you are adding sources.

Procedure

1. At the Package Manager command prompt, type wasp listrepository. The currently defined sources are displayed in a list.
2. Use one of the following methods to add repository sources:
   - To add repository sources to the end of the existing list, type wasp addrepository bin <repositoryUri> <platformname> <sectionname> .
   - To add a repository and assign it a particular place in the list, type wasp insertrepository bin <repositoryUri> <platformname> <sectionname> <indexnumber>. When using insertrepository, the number specifies where the source is inserted in the repository source in the list, and therefore the order in which the repository is processed when determining if a package is available for download. A value of 0 (zero) puts the repository source at the top of the list.

   See "Package Manager for WindowsCommand Line Options" on page 55 for more information about other arguments related repositories.
3. Press **Enter**. The entry is added to the repository list.
4. Type wasp listrepository. The format (bin) and URI are displayed in the list along with the platform and section.

Remove Repository Sources

A source is the combination of a platform and section in a repository. Removing repository platforms and sections to the repository list allows you to control which repository sources the Package Manager for Windows uses when installing and removing software.

CAUTION If you remove a repository source from which a particular package was installed, and the package is no longer available in the local cratecache folder, you will not be able to uninstall the package.

Prerequisites

The repository entries exist in repository.xml, located in `C:\Documents and Settings\All Users\Application Data\VMware\Wasp`.

Procedure

1. At the Package Manager command prompt, type wasp listrepository. The currently defined sources are displayed in a list.
2. To remove a repository source, type wasp removerepository bin <repositoryUri> <platformname> <sectionname>. See "Package Manager for WindowsCommand Line Options" on page 55 for more information about other arguments related repositories.
3. Press **Enter**. The entry is removed from the repository list.
4. Type wasp listrepository. Verify that the repository source has been removed.

Install Packages

The installation of packages is run as a command line function. Installing a published package includes processing dependencies.

Prerequisites

The package is listed as a repository source in Package Manager for Windows. See "Add Repository Sources " on page 53 for more information.

Procedure

1. At the Package Manager command prompt, type wasp list all. The available packages are displayed in a table.
2. Type wasp <switches> install "<packagename> <arguments>". See "Package Manager for WindowsCommand Line Options" on page 55 for more information about the switches and arguments related to installing packages.
3. Press **Enter**. The package is downloaded from the repository to the `[path]\cratecache\` location. If you did not use the `/q=y` switch, the command requires a response from you after downloading the package. Type `Y` to install now. Type `N` if you want to install later.
4. Type wasp list. The package is displayed in the list as installed.

Remove Packages

Uninstalls the software included in the selected packages. Optionally, you can also uninstall any dependencies not used by other software packages. The removal of packages is run as a command line function.

Prerequisites

The package includes uninstall files and commands.

The package is located in the local cratecache folder or listed as a repository source in Package Manager for Windows.

Procedure

1. At the Package Manager command prompt, type wasp list. The installed packages are displayed in a table.
2. Type wasp <switches> remove "<packagename> <arguments>" . See "Package Manager for WindowsCommand Line Options" on page 55 for more information about the switches and arguments related to removing packages.
3. Press **Enter**.
4. If you did not use the /q=y switch, the command requires a response from you before running the uninstall in the package. Type Y to uninstall now. Type N to cancel the uninstall process.
5. Type wasp list. The package is displayed in the list as installed.

Package Manager for WindowsCommand Line Options

Package Manager for Windows to installs and removes packages from the machines on which it is installed. The following are the command line options that can be run on each machine where Package Manager is installed.

Using the command line options, you can manage only one machine at a time.

To use the command line options, you must run the commands from the folder where wasp.exe is installed. The default location is C:\Program Files (x86)\VMware\VCM\Tools\Package Manager for Windows.

Requirements and Considerations

- Each command is preceded by `wasp`. For example, wasp update.
- The switches and arguments are added in the following order:
  1. `wasp` (the command)
  2. switches (in any order)
  3. command
  4. arguments (use double quotes around the argument (for example, "sqlserver >= 9.00.1399.06-b"))

Example: wasp /q=y /AllowUnsigned=y install "sqlserver >= 9.00.1399.06-b"

Wasp Command Line Options

The commands, including arguments and switches, are described below:

Install Package

Table 6–1. Install Command Line Switches and Arguments

Command	Command Line Arguments	Command Line Switches	Comments
install			Install new packages.
	package name		Name of the package without the .crate extension.
	version		Use <; >; =; <=; >= to specify version. Include quotes around the entire argument, for example, "sqlserver >= 9.00.1399.06-b".
		/LoginName	For unattended installs requiring reboot you can call install with LoginName, LoginPassword, and LoginNetwork.
		/LoginPassword	For unattended installs requiring reboot you can call install with LoginName, LoginPassword, and LoginNetwork
		/LoginDomain	For unattended installs requiring reboot you can call install with LoginName, LoginPassword, and LoginNetwork.
		/d	Download packages from repository. If no arguments are added, it only downloads the packages to the local cratecache. ■ **all:** Downloads all packages before installing any of them. ■ **each:** Downloads and then installs each package before downloading and installing the next package. ■ **none:** Does not download any packages, instead only uses the local cratecache copy. Example: /d=each install notepad .
		/q	Default value =n. If you use =y, does not stop and prompt after displaying the installation plan.

Command	Command Line Arguments	Command Line Switches	Comments
		/AllowUnsigned	Default value =n. If you use =y, the package is installed even if the package is unsigned. Example: /AllowUnsigned=y install notepad.
		/NoSignature	Default value =n. If you use =y, the package is installed without attempting to verify the signature.
		/ContinueOnInsufficientSpace	Default value =n. If you use =y, the installation proceeds even if the system drive does not have enough space for the package contents.
		/overwrite	Default value =n. If you use =y, the removal process overwrites any unfinished tasks from the previous command. The value is used only in conjunction with the /q=y value.

Remove Package

Table 6–2. Remove Command Line Switches and Arguments

Commands	Command Line Arguments	Command Line Switches	Comments
remove			Remove installed software package.
	package name		Name of the package without the .crate extension.
	version		Use <; >; =; <=; >= to specify version. Include quotes around the entire argument, for example, "sqlserver >= 9.00.1399.06-b".
		/LoginName	For unattended uninstalls requiring reboot you can call with LoginName, LoginPassword, and LoginNetwork.
		/LoginPassword	For unattended uninstalls requiring reboot you can call with LoginName, LoginPassword, and LoginNetwork .
		/LoginDomain	For unattended uninstalls requiring reboot you can call with LoginName, LoginPassword, and LoginNetwork.
		/d	Download packages from repository. If no arguments added, it only downloads the packages to the local cratecache. ■ **all:** Downloads all packages before uninstalling any of them. ■ **each:** Downloads and then uninstalls each package before downloading and uninstalling the next package. ■ **none:** Does not download any packages, instead only uses the local cratecache copy. Example: /d=all remove notepad
		/q	Default value =n. If you use =y,

Commands	Command Line Arguments	Command Line Switches	Comments
			does not stop and prompt after displaying the removal plan.
		/AllowUnsigned	Default value =n. If you use =y, the package is uninstalled even if the package is unsigned. Example: /AllowUnsigned=y remove notepad.
		/NoSignature	Default value =n. If you use =y, the package is uninstalled without attempting to verify the signature.
		/overwrite	Default value =n. If you use =y, the removal process overwrites any unfinished tasks from the previous command. The value is used only in conjunction with the /q=y value.

Autoremove Packages

Table 6–3. Autoremove Command Line Switches and Arguments

Commands	Command Line Arguments	Command Line Switches	Comments
autoremove			Identify and remove packages that were installed as dependencies but that are no long depended upon by any packages.
		/LoginName	For unattended upgrades requiring reboot you can call with LoginName, LoginPassword, and LoginNetwork
		/LoginPassword	For unattended upgrades requiring reboot you can call with LoginName, LoginPassword, and LoginNetwork
		/LoginDomain	For unattended uninstalls requiring reboot you can call with LoginName, LoginPassword, and LoginNetwork.
		/d	Download packages from repository. If no arguments added, it only downloads the packages to the local cratecache. ■ **all:** Downloads all packages before uninstalling any of them. ■ **each:** Downloads and then uninstalls each package before downloading and uninstalling the next package. ■ **none:** Does not download any packages, instead only uses the local cratecache copy. Example: /d=all autoremove notepad
		/q	Default value =n. If you use =y, does not stop and prompt after displaying the removal plan.
		/AllowUnsigned	Default value =n. If you use =y, the package is uninstalled even if

Commands	Command Line Arguments	Command Line Switches	Comments
			the package is unsigned. Example: /AllowUnsigned=y remove notepad.
		/NoSignature	Default value =n. If you use =y, the package is uninstalled without attempting to verify the signature.
		/overwrite	Default value =n. If you use =y, the removal process overwrites any unfinished tasks from the previous command. The value is used only in conjunction with the /q=y value.

List Installed Packages

Table 6–4. List Command Line Switches and Arguments

Commands	Command Line Arguments	Command Line Switches	Comments
list			List of installed packages.
	all		List of known packages. Possible status values: ■ **Candidate:** Package Manager is aware of the package in at least one repository. ■ **Installed:** Package is installed.
		/v	Verbose output. Example: wasp /v list all.
		/x	Output in XML

Updated Package Information

Table 6–5. Update Command Line Switches and Arguments

Commands	Command Line Arguments	Command Line Switches	Comments
update			Retrieve updated package information from source repositories. No data is displayed after the command.

Status

Table 6–6. Status Command Line Switches and Arguments

Commands	Command Line Arguments	Command Line Switches	Comments
status	package name		Provides a list of running tasks or, if given a package name, provides the state of the package. Format is wasp status notepad or wasp status "notepad=2.0"

Clear Status

Table 6–7. Clear Status Command Line Switches and Arguments

Commands	Command Line Arguments	Command Line Switches	Comments
clear status	package name		Given a package name, the command clears the state of the first matching package. Format is wasp clear status notepad or wasp clear status "notepad=2.0"

Resume Execution of Commands

Table 6–8. Resume Command Line Switches and Arguments

Commands	Command Line Arguments	Command Line Switches	Comments
resume			Continues the execution of a list of commands in order to support reboots during a set of commands. Runs off of a file named tls.tls. The file's default location is %APPDATA%.

List Repositories

Table 6–9. Listrepository Command Line Switches and Arguments

Commands	Command Line Arguments	Command Line Switches	Comments
listrepository			Lists all entries in repository.xml.

Add Repository

Table 6–10. Addrepository Command Line Switches and Arguments

Commands	Command Line Arguments	Command Line Switches	Comments
addrepository			Adds an entry to the end of the list in repository.xml. Default location is C:\Documents and Settings\All Users\Application Data\VMware\Wasp.
	RepositoryEntry		Format is addrepository bin <repositoryUri> <platformname> <sectionname> where bin specifies the format. Use single or double quotes around the repositoryUri if it contains spaces. Example: wasp addrepository bin http://server/softwarerepository Win7 Release. In this example, the wasp command is also displayed.

Insert Repository

Table 6–11. Insertrepository Command Line Switches and Arguments

Commands	Command Line Arguments	Command Line Switches	Comments
insertrepository			Adds an entry to repository.xml at the specified index point.
	RepositoryEntry		Format is insertrepository bin <repositoryUri> <platformname> <sectionname> <indexnumber> Example: wasp insertrepository bin http://server/softwarerepository Win7 Release 0. In this example, the wasp command is also displayed and the index insertion point is at the beginning of the existing list.
	index		0-based index of the position to insert the record into Example: wasp insertrepository bin http://server/softwarerepository Win7 Release 2. In this example, the wasp command is also displayed and the index insertion point is third in the existing list. 0 is first.

Remove Repository

Table 6–12. Removerepository Command Line Switches and Arguments

Commands	Command Line Arguments	Command Line Switches	Comments
removerepository			Removes an entry from repository.xml
	RepositoryEntry		Format is removerepository bin <repositoryUri> <platformname> <sectionname>

List Local Cratecache

Table 6–13. Listlocalcratecache Command Line Switches and Arguments

Commands	Command Line Arguments	Command Line Switches	Comments
listlocalcratecache			Displays the cratecache location.

Clean Cratecache

Table 6–14. Clean Command Line Switches and Arguments

Commands	Command Line Arguments	Command Line Switches	Comments
clean			Erase downloaded archive files in the cratecache folder.

Maintain Package Manager for Windows Data

In addition to the tasks of installing and removing packages, and adding and removing repository sources, you can use wasp commands to check package status and to keep your machines current.

The following are only a few suggested commands. For a complete list of commands and switches, see "Package Manager for WindowsCommand Line Options" on page 55

Package Manager Maintenance

When working in Package Manager, data may become out of date if you are performing many actions at one. Use wasp update to refresh the data regarding repository sources, cratecache files, and external software.

To view a list of installed packages, type wasp list.

To view a list of all packages, including installed, preinstalled, and candidates, type wasp list all. Installed packages have been installed on the machine, candidates are packages in source repositories that are eligible for installation but not installed on the machine.

The cratecache folder stores the local copies of packages installation/removal files. To determine to location of the cratecache, type wasp listlocalcratecache.

You may delete files from the cratecache; however, when you issue a remove command for the package, the file will be downloaded from the repository in order to run the remove commands. You should only remove a package from the cratecache if you know it is still available in a repository. If it is not in the cratecache nor is it in the repository, you will not be able to remove the software. To delete the files from the folder, type wasp clean.

Repository Source Maintenance

Viewing a list of all repository sources of which Package Manager is aware helps to ensure that you install packages only from approved sources. Type wasp listrepository.

If, when reviewing the list, you need to remove a repository source from the list, type wasp removerepository bin <repositoryUri> <platformname> <sectionname>. See "Remove Repository Sources" on page 54 for more information.

CAUTION If you remove a repository source from which a particular package was installed, and the package is no longer available in the local cratecache folder, you will not be able to uninstall the package.

Some packages are installed as dependencies for other packages. You can remove unused dependencies using wasp autoremove. See "Package Manager for WindowsCommand Line Options" on page 55 for more about the associated switches.

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